Proton Plan Status
March Report

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Jeff Sims

Agenda

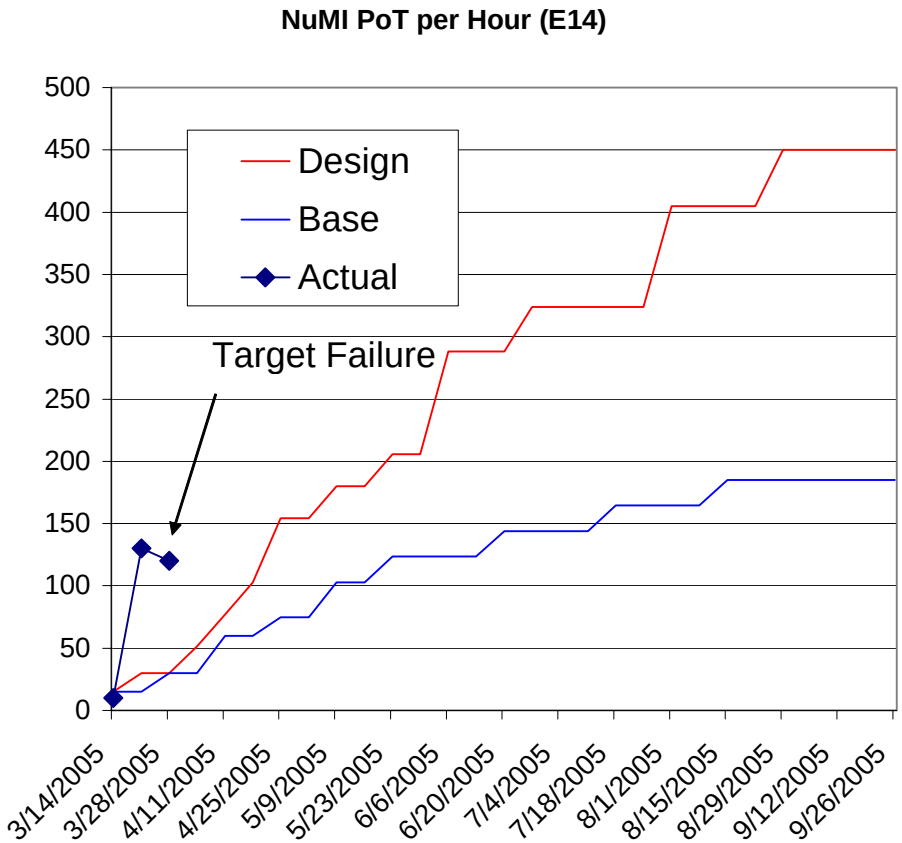
- Operations Report – E. Prebys
- Technical Progress – E. Prebys
- NuMI Target Status – D. Bogert
- Project Status and Cost Report – J. Sims

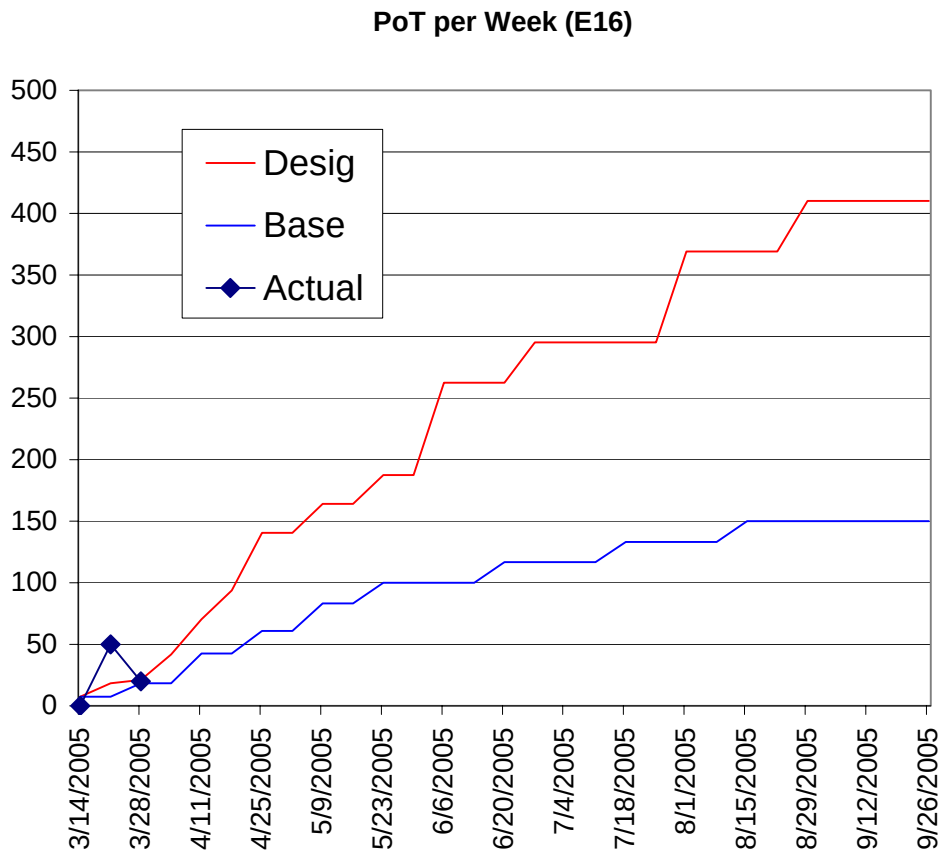
Operations Report

Proton Delivery

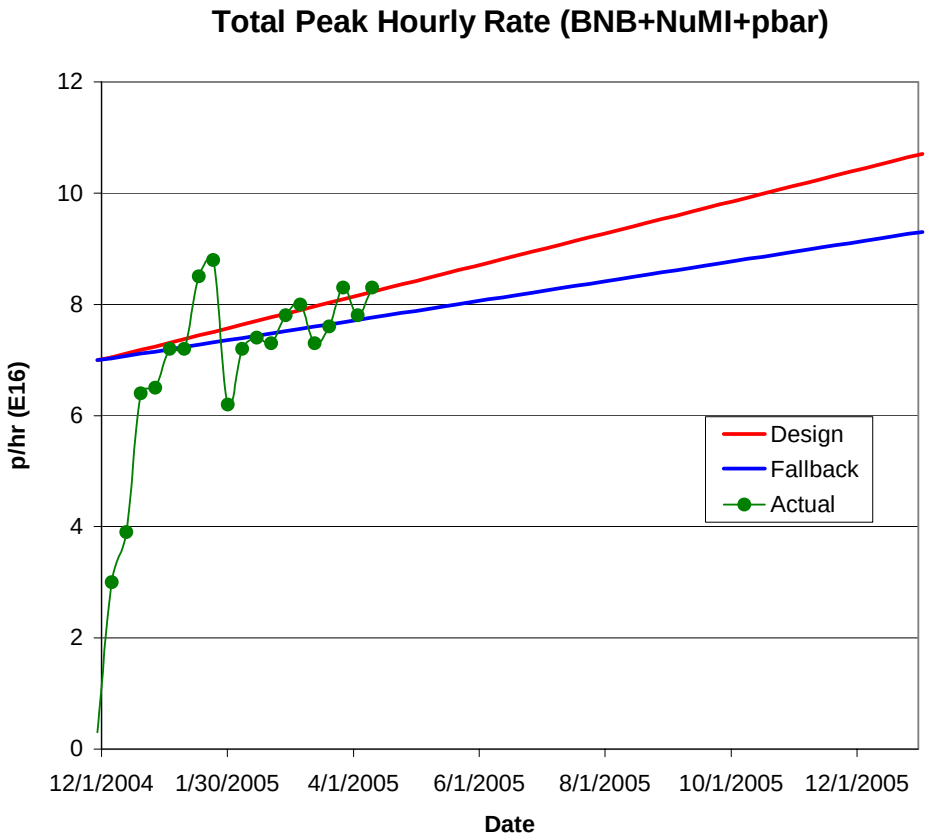
- In light of the NuMI target failure, it's not meaningful to analyze separate NuMI and BNB progress separately.
- After summarizing initial NuMI performance, we will concentrate on total proton delivery:
  - Hourly rates: compare actual total rate to pbar+BNB+NuMI projections.
  - Integrated total: compare MiniBooNE actual to BNB+NuMI projections.
- Except for shutdown dates, these have not changed for 2005 since the November document.

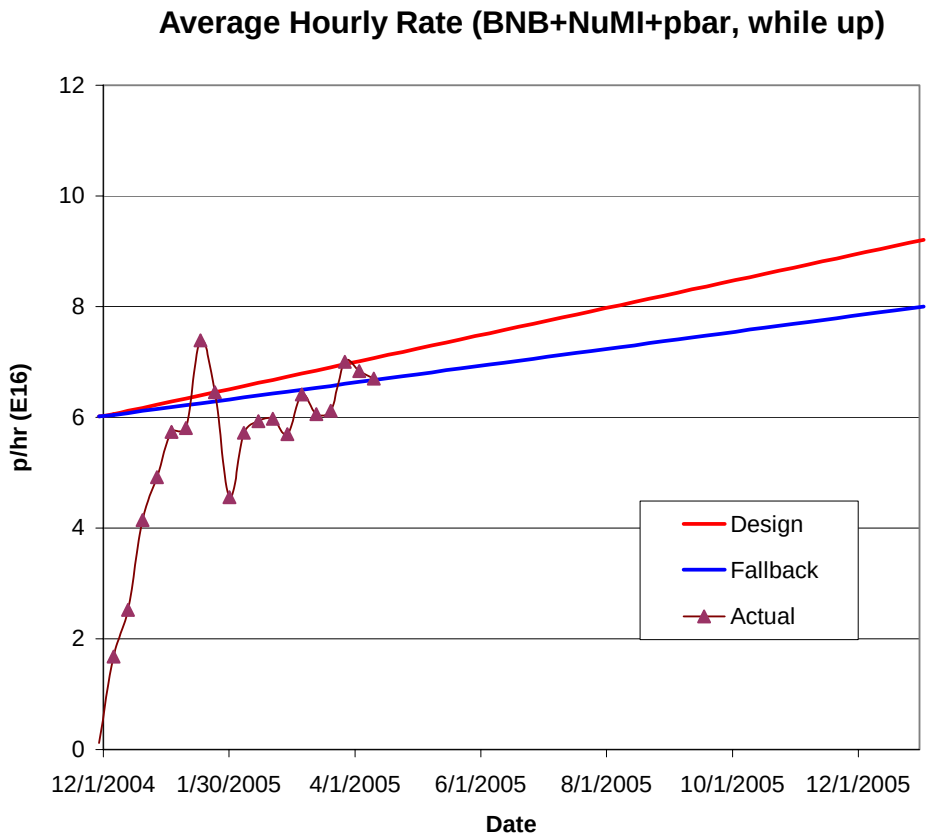
Initial NuMI Progress



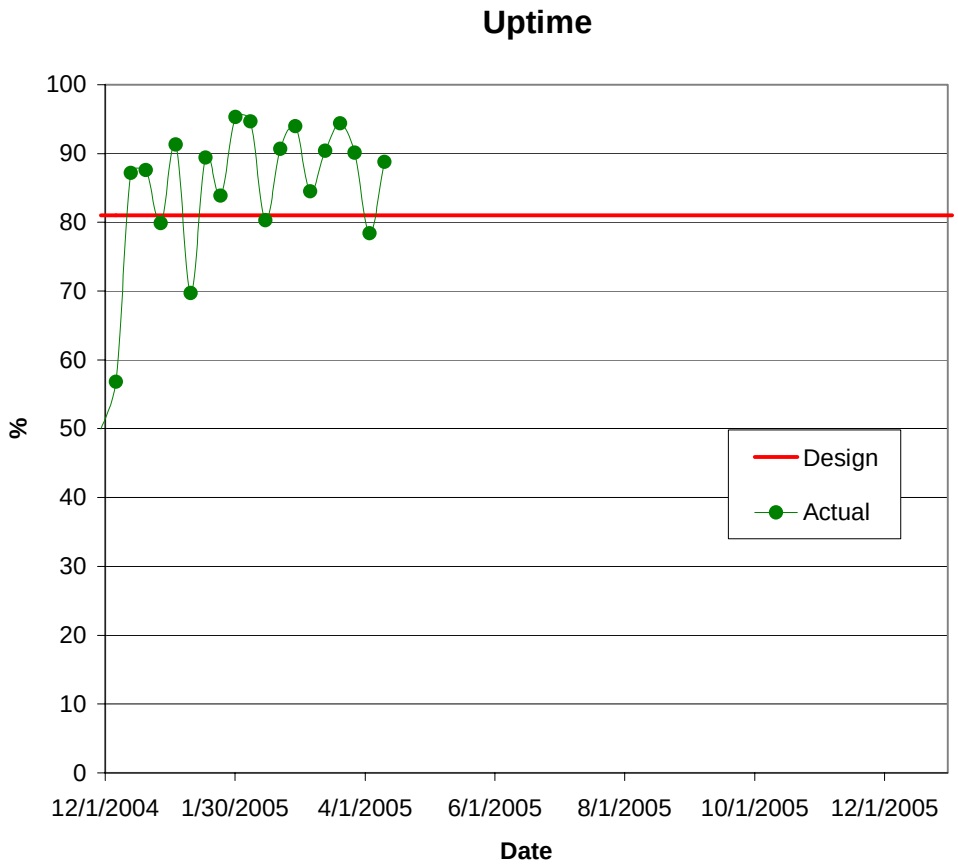


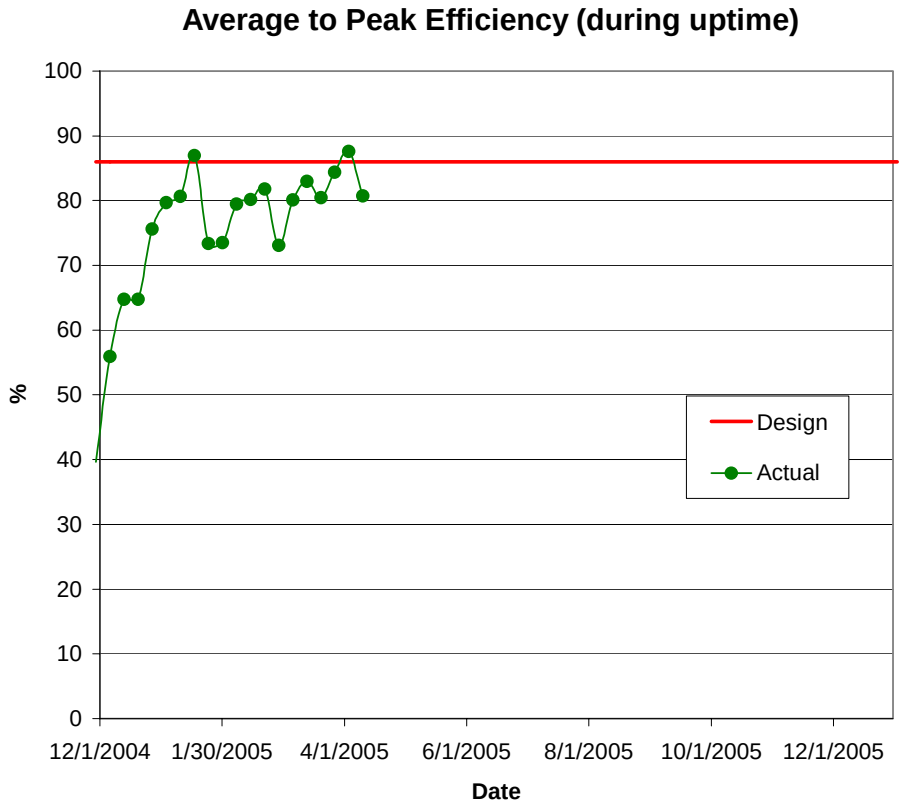
Hourly Proton Rate



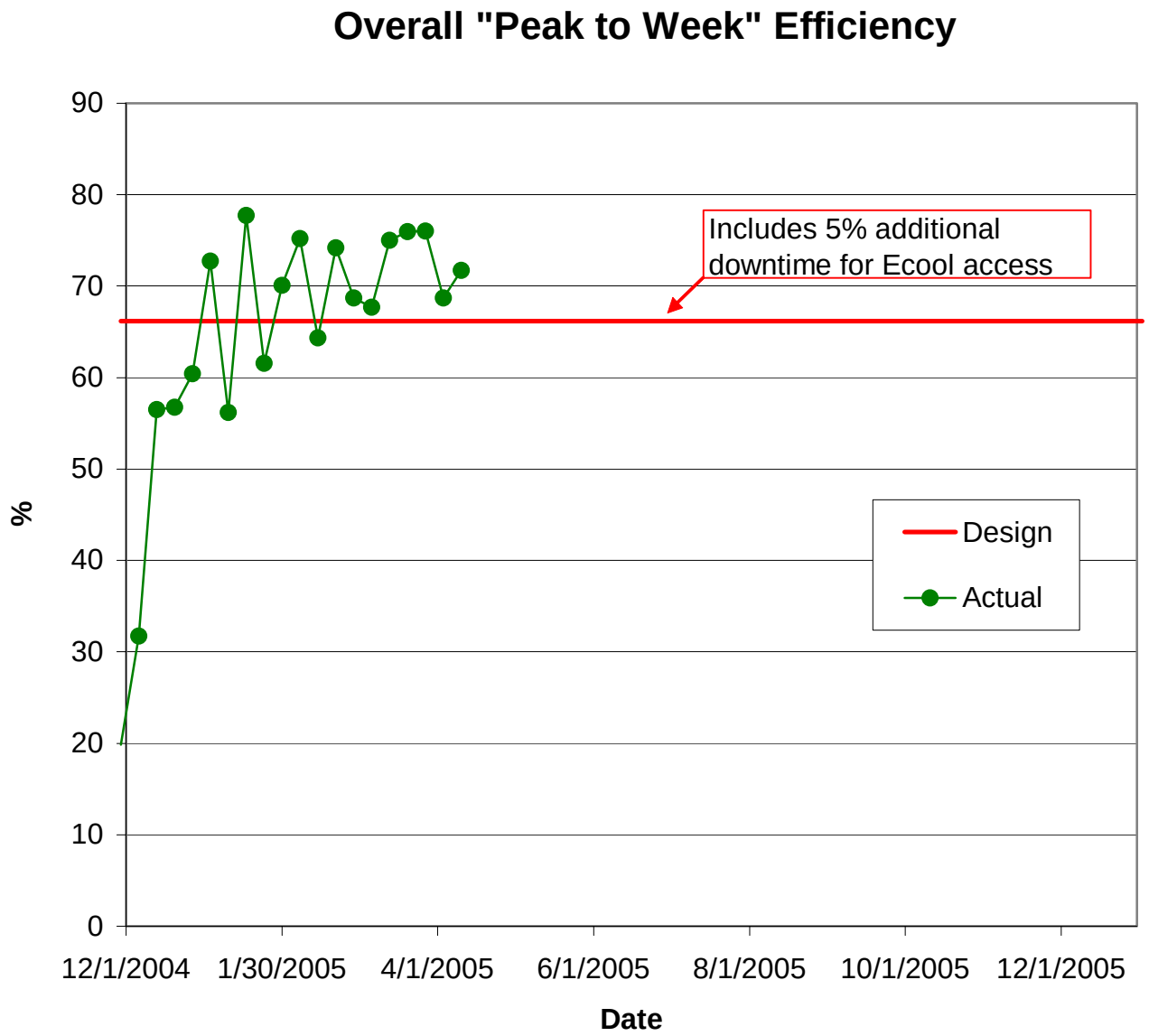


Efficiencies

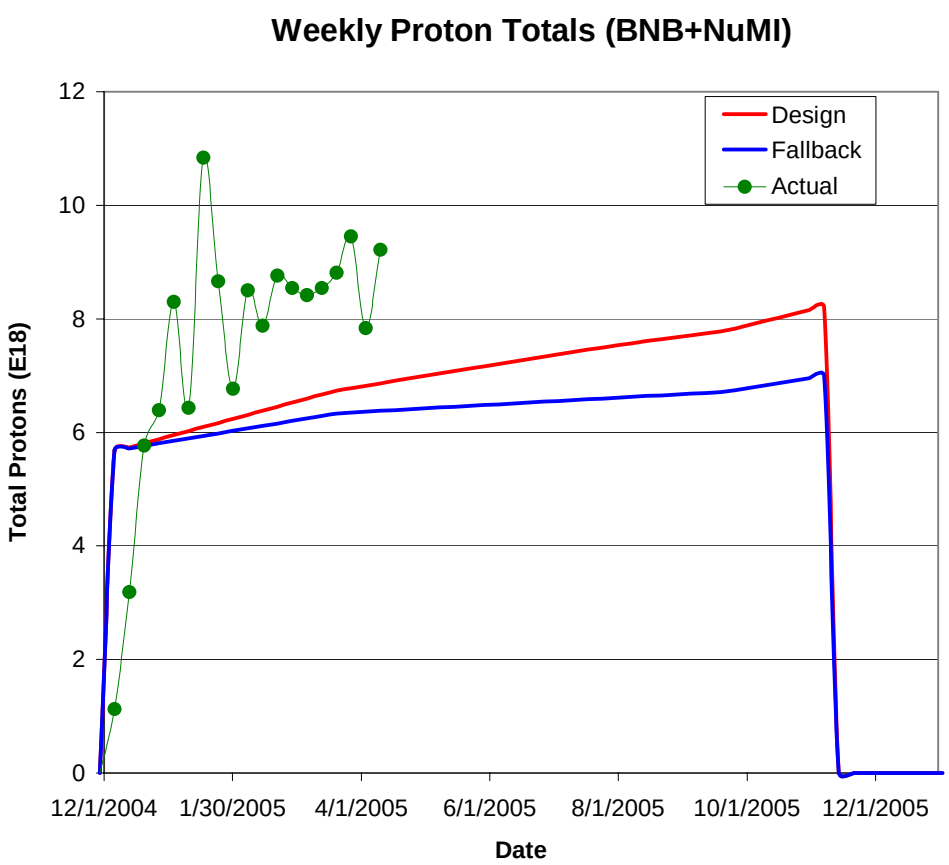


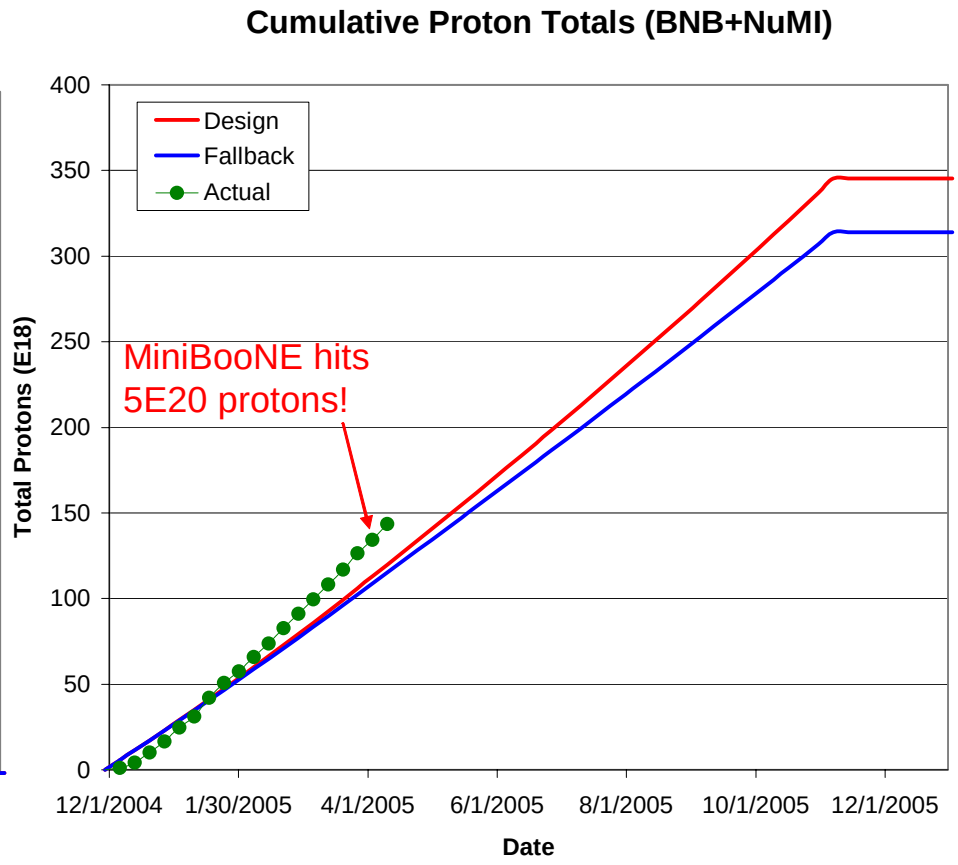


Overall "Peak to Week" Efficiency



Integrated Delivery (BNB)





Technical Progress

Scope Changes

- Criteria to be in plan (one of following):
  - Critical path to plan goals.
  - Expensive (>$200K)
  - Requires significant coordination across departments
- Descoped:
  - Instrumentation upgrades
  - Booster solid state RF
- Added (proposed):
  - Booster dump relocation
  - New booster notcher
  - Main Injector injection kicker mods
  - Pbar extraction kicker mods
  - Stage II working group

Progress

- Baseline plan
  - The majority of scheduled tasks have been assigned dates and populated with resources based on information provided by level 3 managers.
- Technical Progress

  Linac
  - 1.01.01 PA Vulnerability –
    - AD Effort - 7835 tubes have been ordered
    - Sale of Burle – discussed shortly
  - 1.01.02 Quad PS –
    - Proceeding with 300 A prototype test and specifications
  - 1.01.03 Instrumentation – (descoped)

  Booster
  - 1.02.01 Determine Rep Rate Limit –
    - Ducar beginning to investigatge
  - 1.02.02 Orbump –
    - TD Effort - First Magnet is complete. 15% complete with the assembly of the remaining magnets (costs collected in Run II)
    - AD Effort - Power supply specification and simulations are complete. Procurement is now underway.

Progress

Booster

- 1.02.03 Correctors –
  - TD Effort – Design and Early Procurements are beginning.
- 1.02.04 30 Hz Harmonic –
  - Procurement proceeding for prototype test
- 1.02.05 Gamma T –
  - Studies continue
- 1.02.06 Alignment Improvements –
  - Put BPM offsets into databse
- 1.02.07 Drift Tube Cooling – (no significant progress)
- 1.02.08 Cavity #20 – (no significant progress)
- 1.02.09 SS RF PA's – Descoped
- 1.02.10 Instrumentation Upgrade - Descoped
- 1.02.11 Booster Dump Relocation – NEW SCOPE
  - Discussed shortly
- 1.02.12 Booster Chopper - NEW SCOPE
  - Working on specifications

Progress

Main Injector

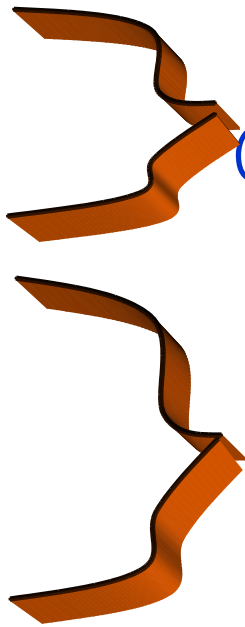
- 1.03.01 Large Aperture Quads –
  - TD Effort – Design and Procurement are nearly complete. Fabrication of the first unit is 30% complete.
- 1.03.02 Collimation –
  - AD Effort - Beam loss studies in MI and MI-8 are ongoing. Residual Radiation measurements and simulations will begin soon.
- 1.03.03 NuMI MultiBatch Operations –
  - Barrier Bucket Procurement , Mixed Mode Operations
  - NEW SCOPE- Injection Kicker Replacement, Extraction Kicker Modifications
- 1.03.04 RF Upgrade –
  - Discussed shortly

Studies

- 1.05 Proton Study Group–
  - NEW SCOPE – Discussed shortly

Burle Status

- Burle has been sold:
  - Buyer still confidential, but "foreign", so must be approved by the government
  - Rumored to "sort of" have "something to do" with "tubes" already
    - might mean test tubes, tube socks, tube tops, etc.
  - Must continue to support coaxitron for the Navy until ~2020
  - In light of that, it is claimed that we are still profitable.
- Current delivery schedule (21 total):
  - APR-05: 1
  - MAY-05: 3
  - JUN-05: 3
  - JUL-05: 2
  - AUG-05: 0
  - SEP-05: 2
  - OCT-05: 2
  - NOV-05: 2
  - DEC-05: 2
  - JAN-06: 2
  - FEB-06: 2



Standard order
(mostly rebuilds)

Proton Plan order
(all new)

NEW SCOPE - Long 13 Relocation (1.02.11)

- Even after the lattice improvements of recent years ("dogleg fix"), the original extraction at Long 13 remains a major source of loss in the Booster.
- This extraction region is needed for
  - Short batches
  - Study cycles
  - RDF
- It is relatively straightforward and inexpensive (few hundred K$) to move this dump to the MI-8 line.
  - Move kickers from Long 12
  - Install spare extraction septum
  - Move power supplies
  - Use MiniBooNE test dump
- Loses RDF, but SY120 a better option for radiation studies.
- Working on detailed plan.
- Will do it in the 2005 shutdown.

Main Injector RF (1.03.04)

- The Main Injector Upgrade path remains the single largest uncertainty in the Proton Plan
  - Might be possible to reach intensities of the current Plan without upgrades of any kind.
- Towards a decision
  - Proceed with two/PA prototype
  - Proceed with systematic studies in the Main Injector
  - Organize a workshop this summer
    - Will consider the following
      - Potential of feed forward system
      - Potential and concerns with two PA solution
      - New RF system proposals.
    - Will coordinate needs of current plan, Stage II Plan, and Proton Driver
    - Generate a perfomance/price table
  - Goal: reach a decision for Stage I by end of FY05

NEW SCOPE - Proton Plan Stage II (1.05)

- In the wake of the BTeV cancellation, a committee formed to study options for maximizing proton delivery after the end of the collider program (~2009):
  - Mike Syphers (chair)
  - Paul Derwent
  - Jim Hylen
  - Sergei Nagaitsev
  - Ralph Pasquinelli
  - Eric Prebys
- Committee has met several times and is actively soliciting ideas from any interested parties.
- Report to Division Head June 1, 2005.
- NOTE: The actual implementation of the recommendations of this commitee is beyond the scope of the present plan.